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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/580,678

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Marcel Bouffier

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EXAMINER

PALABRICA, RICARDO J

ART UNIT

PAPER NUMBER

3663

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/580,678	<b>Applicant(s)</b> BOUFFIER, MARCEL	
	<b>Examiner</b> Rick Palabrica	<b>Art Unit</b> 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 12-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/26/06</u> .   | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 12, 21 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by any one of EP 0 196 655 (IDS) or Nagano et al. (U.S. 5,008,070) or Aoyama et al. (U.S. 4,689,195).

#### EP 0 196 655

As to claims 12 and 21, applicant's claim language reads on the EP 0 196 655 fuel assembly as follows (e.g., see Fig. 6, and paragraph bridging pages 29 and 30, ): a) "first central group" reads on the group of large diameter fuel rods; b) "outer peripheral layer of rods" reads on the group of small diameter fuel rods that have less nuclear reactivity than the first central group of rods. The reference discloses that the fuel for the fuel assembly can be slightly enriched uranium dioxide only (see page 13, lines 24+).

As to claim 21, EP 0 196 655 has a fuel rod network with a square outer contour.

As to claim 22, it is inherent that when the above EP 0 196 655 fuel assembly is used in an operating reactor, at least two of these assemblies are required to achieve criticality and the required operating power level.

Nagano et al.

As to claims 12 and 21, applicant's claim language reads on Nagano et al.'s fuel assembly as follows (e.g., see Fig. 1): a) "first central group" reads on the group of fuel rods designated as "1" (e.g., the "1" rods in any one of cols. 3-6 from the top); b) "outer peripheral layer of rods" reads on the group of fuel rods designated as "3" and "4" on the outer contour (i.e., outermost rows and columns), having enrichment that is less than the first group's enrichment (see Fig. 1B).

As to claim 21, Nagano et al. has a fuel rod network with a square outer contour (e.g., see Fig. 1A).

As to claim 22, it is inherent that when the above Nagano fuel assembly is used in an operating reactor, at least two of these assemblies are required to achieve criticality and the required operating power level.

Aoyama et al.

As to claims 12, and 21, applicant's claim language reads on Aoyam et al.'s fuel assembly as follows (e.g., see Fig. 11 and Table 5): a) "first central group" reads on the group of fuel rods designated as "19" (e.g., the "19" rods in any one of cols. 3-5 from the top); b) "outer peripheral layer of rods" reads on the group of fuel rods designated as "21" and "22" on the outer contour (i.e., outermost rows and columns) having enrichment that is less than the first group's enrichment (see Fig. 1B).

As to claim 21, Aoyama et al. has a fuel rod network with a square outer contour (e.g., see Fig. 1A).

As to claim 22, it is inherent that when the above Aoyama fuel assembly is used in an operating reactor, at least two of these assemblies are required to achieve criticality and the required operating power level.

2. Claims 13-17 are rejected under 35 U.S.C. 102(b) as being anticipated by either one of Nagano et al. (U.S. 5,008,070) or Aoyama et al. (U.S. 4,689,195).

Nagano et al.

As to claim 13, applicant's claim language reads on Nagano et al.'s fuel assembly as follows (e.g., see Fig. 1): a) "second group" reads on the group of fuel rods designated as "3" and "4" on the outer contour (i.e., outermost rows and columns); b) "third group" reads on rods designated as "5" arranged at the corners of the fuel assembly. Note that the third group has a uranium-235 enrichment that is less than the second group's enrichment and the latter has an enrichment that is less than the first group's enrichment (see Fig. 1B).

As to claims 14 and 17, the second group (i.e., rods "3" and "4") extends, for each of the faces of the outer contour of the network of rods, and the third group (i.e., rods "5" comprises only the fuel rods at the corners of the outer contour.

As to claim 15, Nagano et al. meet the claim limitation because the uranium enrichment is dependent upon the U-235/U-238 ratio, and a higher enrichment requires a higher U-235/U-238 mass ratio.

Aoyama et al.

As to claim 13, applicant's claim language reads on Aoyama et al.'s fuel assembly as follows (e.g., see Fig. 11 and Table 5): a) "second group" reads on the group of fuel rods designated as "21" and "22" on the outer contour (i.e., outermost rows and columns); b) "third group" reads on rods designated as "23" arranged at the corners of the fuel assembly. Note that the third group has a uranium-235 enrichment that is less than the second group's enrichment and the latter has an enrichment that is less than the first group's enrichment (see Fig. 1B).

As to claims 14 and 17, the second group (i.e., rods "21" and "22") extends, for each of the faces of the outer contour of the network of rods, and the third group (i.e., rods "23" comprises only the fuel rods at the corners of the outer contour.

The claims are replete with statements that are either essentially method limitations or statements of intended or desired use. For example, "for a pressurized water reactor," etc. These clauses, as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference, as long as the structure of the cited references is capable of performing the intended use. See MPEP 2111-2115.

See also MPEP 2114 that states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531.

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[A]pparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525,1528.

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

Any one of the systems in the cited references is capable of being used in the same manner and for the intended or desired use as the claimed invention. Note that it is sufficient to show that said capability exists, which is the case for the cited references. For example, the fuel assembly disclosed by either Nagano et al. or Aoyama et al., when used in a nuclear reactor, requires a cruciform control rod disposed in the space between four adjacent fuel assemblies of the reactor core. The same control rod/fuel assembly configuration is used in a pressurized water reactor (e.g., see Thorpe (U.S. 3,048,532) at Fig. 2 and col. 2, lines 43+, or Thorpe (U.S. 3,576,717) at col. 1, lines 35+).

3. Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by Aoyama et al., who disclose a first level of enrichment equal to 3.6%. As to the applied art meeting the claim limitation, note MPEP 2131.03, which states:

"[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is 'anticipated' if one of them is in the prior art." *Titanium Metals Corp. v. Banner*; 778 F.2d 775, 227 USPQ 773.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Nagoya et al. or Aoyama et al.

The specific levels of enrichment of the groups of fuel rods are matters of design and/or optimization (notwithstanding the fact that Aoyama et al. anticipates claim 20, as discussed in section 2 above). The enrichment depends upon constraints that include the required power level, burn-up, and fuel management scheme that the utility adopts for the reactor. Additionally, the selected enrichment levels have to be optimized in order for the reactor to generate the maximum energy output at the lowest possible cost.

See MPEP 2144.05 II.A as to matters of optimization within prior art conditions or through routine experimentation.

Note also that MPEP 2144.05.II (Optimization) requires that a particular parameter be recognized as a result-effective variable, i.e., a variable which achieves a recognized result. The enrichment of fuel rods in an assembly is clearly a result effective variable, which achieves varying degrees of benefits. Different enrichments for these fuel rods will affect, e.g., fuel burnup and shutdown margin, but are largely predictably.



***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References C-F further illustrate prior art.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

November 3, 2008

/Rick Palabrica/  
Primary Examiner, Art Unit 3663

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